

**What is claimed is:**

1. Isolated Apo-2 polypeptide having at least 80% amino acid sequence identity with native sequence Apo-2 polypeptide comprising amino acid residues 1 to 411 of SEQ ID NO:1.
- 5 2. The Apo-2 polypeptide of claim 1 wherein said polypeptide has at least 90% amino acid sequence identity.
3. The Apo-2 polypeptide of claim 2 wherein said polypeptide has at least 95% amino acid sequence identity.
4. Isolated Apo-2 polypeptide comprising amino acid residues 1 to 411 of SEQ ID NO:1.
- 10 5. Isolated extracellular domain sequence of Apo-2 polypeptide comprising amino acid residues 54 to 182 of SEQ ID NO:1.
6. The extracellular domain sequence of claim 5 comprising amino acid residues 1 to 182 of SEQ ID NO:1.
- 15 7. Isolated death domain sequence of Apo-2 polypeptide comprising amino acid residues 324 to 391 of SEQ ID NO:1.
8. A chimeric molecule comprising the Apo-2 polypeptide of claim 1 or the extracellular domain sequence of claim 5 fused to a heterologous amino acid sequence.
- 20 9. The chimeric molecule of claim 8 wherein said heterologous amino acid sequence is an epitope tag sequence.
10. The chimeric molecule of claim 8 wherein said heterologous amino acid sequence is an immunoglobulin sequence.
- 25 11. The chimeric molecule of claim 10 wherein said immunoglobulin sequence is an IgG.
12. Isolated nucleic acid comprising a DNA encoding the polypeptide of claim 1, the extracellular domain sequence of claim 5, or the death domain sequence of claim 7.
13. The nucleic acid of claim 12 wherein said DNA encodes an Apo-2 polypeptide comprising amino acid residues 1 to 411 of SEQ ID NO:1.
- 30 14. A vector comprising the nucleic acid of claim 12.
15. The vector of claim 14 operably linked to control sequences recognized by a host cell transformed with the vector.
- 35 16. The vector of claim 14 comprising ATCC deposit accession number 209021.
17. A host cell comprising the vector of claim 14.

18. The host cell of claim 17 comprising a CHO cell.
19. The host cell of claim 17 comprising *E. coli*.
20. The host cell of claim 17 comprising a yeast cell.
21. A process of producing an Apo-2 polypeptide comprising  
5 culturing the host cell of claim 17 under conditions  
sufficient to express Apo-2 polypeptide and recovering the  
expressed Apo-2 polypeptide from the culture.
22. An Apo-2 polypeptide which is obtained or obtainable by  
expressing the polypeptide encoded by the cDNA insert in ATCC  
10 deposit accession number 209021.
23. A non-human, transgenic animal which contains cells that  
express DNA encoding Apo-2 polypeptide.
24. The animal of claim 23 which is a mouse or rat.
25. A non-human, knockout animal which contains cells having an  
15 altered gene encoding Apo-2 polypeptide.
26. The animal of claim 25 which is a mouse or rat.
27. An antibody which specifically binds to an Apo-2 polypeptide.
28. The antibody of claim 27 which is a monoclonal antibody.
29. The antibody of claim 27 comprising an agonistic antibody.
- 20 30. The antibody of claim 27 comprising a blocking antibody.
31. The antibody of claim 24 comprising a chimeric antibody.
32. The antibody of claim 28 wherein said antibody is an IgG  
antibody.
33. The antibody of claim 28 wherein said antibody comprises an  
25 Fab fragment.
34. The antibody of claim 28 wherein said antibody comprises a  
scFv fragment.
35. The antibody of claim 28 wherein said antibody comprises a  
F(ab')<sub>2</sub> fragment.
- 30 36. The antibody of claim 27 wherein said antibody comprises a  
human antibody.
37. The antibody of claim 28 having the biological characteristics  
of the monoclonal antibody produced by the hybridoma cell line  
deposited as ATCC accession number HB-12456.
- 35 38. The antibody of claim 28 wherein the antibody binds to the  
same epitope as the epitope to which the monoclonal antibody

produced by the hybridoma cell line deposited as ATCC accession number HB-12456 binds.

39. A hybridoma cell line which produces the antibody of claim 28.

40. The hybridoma cell line deposited as ATCC accession number HB-12456.

41. The monoclonal antibody produced by the hybridoma cell line deposited as ATCC accession number HB-12456.

42. The antibody of claim 27 wherein said antibody is a single-chain antibody.

43. The antibody of claim 42 wherein said antibody comprises the 16E2 antibody.

44. The antibody of claim 42 wherein said antibody comprises the 20E6 antibody.

45. The antibody of claim 42 wherein said antibody comprises the 24C4 antibody.

46. The antibody of claim 42 wherein said antibody is fused to an epitope tag sequence.

47. A chimeric molecule comprising the antibody of claim 27 fused to a heterologous amino acid sequence.

48. The chimeric molecule of claim 47 wherein said heterologous amino acid sequence comprises an immunoglobulin sequence.

49. A dimeric molecule comprising the Apo-2 antibody of claim 27 and a heterologous antibody.

50. A homodimeric molecule comprising a first Apo-2 antibody and a second Apo-2 antibody.

51. Isolated nucleic acid comprising DNA encoding the Apo-2 antibody of claim 43.

52. Isolated nucleic acid comprising DNA encoding the antibody of claim 44.

53. Isolated nucleic acid comprising DNA encoding the antibody of claim 45.

54. A vector comprising the nucleic acid of claim 51, 52, or 53.

55. A host cell comprising the vector of claim 54.

56. A method of producing an Apo-2 antibody comprising culturing the host cell of claim 55 under conditions wherein the DNA is expressed.

57. A composition comprising the antibody of claim 27 and a carrier.

58. The composition of claim 57 wherein said carrier is a pharmaceutically-acceptable carrier.

5 59. A method of inducing apoptosis in mammalian cancer cells comprising exposing mammalian cancer cells to an effective amount of the Apo-2 agonistic antibody of claim 29.

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60. The method of claim 59 wherein said agonistic antibody comprises a single-chain antibody.

10 61. A method of treating mammalian cancer cells comprising exposing mammalian cancer cells to an agent which activates Apo-2.

62. The method of claim 61 wherein said agent comprises an agonistic Apo-2 antibody.

15 63. An article of manufacture comprising a container and a composition contained within said container, wherein the composition includes Apo-2 polypeptide or Apo-2 antibody.

64. The article of manufacture of claim 63 further comprising instructions for using the Apo-2 polypeptide or Apo-2 antibody in vivo or ex vivo.

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